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No. VI.

*An Account of some Human Bones found on the Coast of Brazil, near Santos. Latitude 24° 30" S. Longitude 46° W. By C. D. Meigs, M.D.—Read 7th December 1827.*

**T**HOSE members of the Philosophical Society who have read Mr König's account of the skeleton carried by Admiral Cochrane from Guadaloupe to England, and preserved in the British Museum, will find considerable interest in the specimens now on the table.

M. Cuvier has decided that not a single example of human bone has been found among the extraneous fossils of animals that are so profusely scattered over the face of the earth; and remarks that "human bones preserve equally well with those of animals when placed in the same circumstances"—whence arises the natural inference "that the human race did not exist in the *countries* in which the fossil bones of animals have been discovered, at the epoch when these bones were covered up; as there can not be a single reason assigned why men should have entirely escaped from such general catastrophes; or, if they also had been destroyed and covered over at the same time, why their remains should not now be found along with those of the other animals." This learned naturalist does not assert that man did not exist at those periods, but says he might have inhabited some narrow regions or coun-

tries which form the bottom of actual seas, where all his remains are buried.

The *homo diluvii testis* et *theoscopos* of Scheuchzer, and the mountain of similar debris described by Spallanzani as existing in Cerigo, have been proved not to belong to our race, and of the jaw dug up among the fossil bones at Cronstadt, Mr C. remarks that no sufficient notes or precautions were taken at the time of its discovery, so to its pretensions also there is a non liquet.

Granting that no human extraneous fossil exists, it is nevertheless admitted that such remains have been found, which, without having undergone any process of lapidification, are of an extremely ancient date, and the more ancient they are, the more interesting do they appear. Professor Blumenbach, for example, has a skull from an ancient Roman tomb, and it is in a good state of preservation. The Egyptian mummies of a very remote age have their osseous structure preserved in a perfect integrity, and there is in these mummies a circumstance which goes to shew that no limit could be properly assigned to the duration of bony organization. I allude to the facts recently published in relation to the dissection of those relics: in M. Passalqua's mummy; the diaphragm still retained its suppleness, though from a papyrus which was deciphered by M. Champollion, the subject was found to be daughter to an officer of the *Temple of Isis at Thebes*. In Dr Granville's dissection, the stomach, kidneys and ovaria were still discernible. Now if the fibrous and membranous structures are capable of being preserved for more than twenty centuries, why may we not suppose the osseous portions of the frame to endure for forty or sixty under favourable circumstances.

The present specimens are particularly interesting, inasmuch as they belong to the American continent, and as adding another link to that chain of testimony concerning the early occupation of this soil, of which the remains are so few and unsatisfactory, but of which another link or strong analogue exists in the Island of Guadaloupe, in a good measure neglect-

ed or disregarded on account of its loneliness or want of connection with similar facts.

These specimens were brought to this country in June last by Captain J. D. Elliott, of the U. S. navy. That officer, with a liberality which can not be too highly esteemed, both in reference to its intrinsic merit and the usefulness of the example, collected in his late cruise on the Brazilian station many interesting objects in natural history, arts, agriculture, &c., with which he has enriched his own country.

While riding along the banks of the river Santos, in his way from the port of Santos to the town of St Paul, he discovered a mound or elevation, whose area he thinks must exceed three acres, and whose height is about fourteen feet. The surface is covered with soil in which grow many large trees.

This mound or hillock is about four miles from Santos, and the little river Santos rises in the mountain of Cubiton, whose summit is elevated about 2500 feet, and stands at the distance of ten miles from the sea.

These bones were dug from the face of the hill where it was cut by the wash of the stream, and are parts of one skeleton out of many hundreds that are still lying in their bed of tufa.

Captain E. describes them as resting in the rock in an oblique direction; the heads uppermost, and the lower extremities dipping at an angle of from  $20^{\circ}$  to  $25^{\circ}$  below the horizon eastwards. This is a very curious fact, if compared with what M. Lavaysse says of the east and west direction of the Guadeloupe skeletons—a position which occasioned them to be regarded as the tenants of some ancient cemetery, though Mr Konig justly remarks that from the looseness of Lavaysse's account of the accompanying petrifications, not much stress is to be laid on his description of this point.

There are in all nine pieces:

No. 1 is the largest, and consists of the left os temporis in a very entire state. To it is attached a portion of the parietal bone and a fragment of the occipital. The specimen is

remarkable for the uncommon thickness of the squamous portion, which just above the petrous part is nearly half an inch through. I have seen, however, a recent skull thicker than this. The mastoid portion is entire.

The squamous and mastoid portions are invested externally with a stalactitic deposit of carbonate of lime, looking very much like mummified skin. The internal or cerebral surface is wholly destitute of any incrustation: whether it was filled with the gangue, or any other substance, I can not tell.

The petrous portion is entire, with the exception of a fragment near its point; the part broken off extended from the foramen innominatum obliquely to the upper orifice of the carotic canal, of which the floor or lower wall is nevertheless in a natural state. In every other respect it is whole. It is proper to remark that along the upper limit of the specimen an old fracture is to be seen, which was probably a fissure, and filled with a greenish matter, probably some ferruginous salt. The diploe is natural, having no lapidification whatever.

No. 2 is part of the superior maxillary bone, exhibiting a portion of its body with the alveoli and bony palate. To it is attached a part of the os palati; also three incisor teeth dislocated from their alveoles, but held nearly in contact with them by the gangue. Close to one of the teeth is a serpula and a piece of oyster shell.

No. 3 is part of the left greater wing of the sphenoid bone.

No. 4 is a remnant of the lower jaw, viz. the angle, the condyloid and coronoid processes, and part of the ramus as far forwards as the foramen for transmitting the nerve and vessels.

Nos. 5 & 6 are pieces of parietal bone.

No. 7 is a piece consisting of broken ribs.

No. 8 an incisor tooth remarkably worn by age.

No. 9 a specimen of the rock of which the mound is composed, and in which the skeletons are imbedded. It consists of fragments of shells united by a stalactitic matter. I beg leave to point out small nodules of carbonaceous matter, which

are curious, inasmuch as similar masses are mentioned by Mr Konig as found in the Guadaloupe rock, and which detonated with nitre like gun powder.

The rock at Guadaloupe, which contains so many skeletons, is covered by high tides, and extends along the shore nearly a mile. Each skeleton seems encased in a large nodule of an oval shape, or in a mass resembling a nodule detached from a larger rock. The rock is described as an "aggregate, composed principally of zoophytic particles, and the detritus of compact limestone. It readily dissolves in diluted nitric acid without leaving any evident residue."—*Konig*.

Mr Konig's rock is "a greyish yellow passing into a yellowish grey. When more closely examined it is found to consist of yellowish grains, intermixed with others of a more or less deep flesh red colour. These grains, though minute, are in some parts of the mass perfectly defined, and in close contact with each other, although no cement is perceptible. In other parts they are, as it were, confluent, forming a more or less porous mass. In others, again, they form a compact mass, in which the former distinct concretions, especially the red ones, are only indicated by a difference of colour."

The specimen of rock before us is certainly a small one, and may, on that account, be an unfit subject for comparison with that described by Mr Konig. In regard to colour it is more nearly blueish grey passing into blue; some parts of it are yellowish: at a little distance from the eye it resembles a piece of dried mud filled with broken oyster-shells. There are particles of a reddish, or rather Spanish brown colour, disseminated through it very sparsely.

This specimen is quite hard and heavy; it has numerous pores or interstices, some of which constitute a sort of very small geodic cavities lined by a drusy looking stalactitic carbonate. The Guadaloupe stone is harder than statuary marble, but I think this is considerably softer.

I can not discover in it a vestige of the yellowish grains described as making so large a part of the stone in the British

Museum; there are several laminæ of a yellowish substance, and some smaller portions of the same kind disseminated here and there—the larger are manifestly splinters and scales of bone, probably from crushed pieces of the skeleton; the latter I can attribute to no other source.

Mr König speaks of several kinds of shells—in this there are many broken oysters and one *serpula*. Mr König does not mention an oyster shell in his description.

A question naturally arises as to the date of that catastrophe which enclosed several hundred individuals in the tufa of the Rio Santos. The aborigines of that coast were always very poor, few and ignorant:—could they erect such a mound?

Monsieur Lavaysse was at Guadaloupe when General Ennouvff wrote his account of the Galibies to M. Faujas St Fond, and says he collected many specimens, as heads, arms, legs, vertebræ, &c. for his own use. He also found *à côté des Squelettes*, mortars, clubs, &c. &c. in a petrified state, and consisting of a basaltic or porphyritic stone. We might ask, how can you petrify a basalt or a porphyry. Mr L. regards the skeletons as indigènes buried in a cemetery.

It seems unlikely that these remains were formally buried by surviving friends. It is unlikely that so solid a stone should have been formed at so great a distance from the sea. The enormous trees that grow on the surface make it necessary to go back many years in search of the date.

I would not venture to differ from the opinion of Mr Cuvier on such a subject as this if I could learn his opinion. I will, however, take the liberty of referring to some appearances of our maritime borders for illustration of the few additional observations I have to make. This alluvion extends from Long Island to the province of Texas, widening in some places till it recedes 150 to 200 miles from the sea shore. From North Carolina to near the mouth of the Mississippi there is traceable, at intervals, a line of beds, consisting mostly of oyster shells in some particular spots of an enormous size. These beds are, at the point where the line crosses Eddistoe

and Savannah rivers, very wide and deep. No doubt they are co-existent with the emerged land; they are not to be considered as the results of human industry. The shore of the Atlantic must have formerly swept nearly in a line with these remarkable deposits. But the Atlantic level has remained nearly what it is for more than 4000 years, and still these oyster shells are whole; they are not petrified; they are occasionally burned for lime. Within this bed, or nearer than it to the sea, are found fossil bones of elephants, &c. which can not be so old as the unfossilized oyster shells, since they could not have been fossilized anterior to the existence of the soil, out of which they are dug, unless you consider them as boulders, which is not admissible. Such fossils do not perhaps deserve the name of extraneous—that is all we can say of them, since they exist in an alluvion.

I am sorry I can not learn the geological character of the mountains of Cubiton. There is a long chain running near the coast from Rio Janeiro southwesterly.

The geologists are at liberty to determine the date and rank of the Santos tufa and thereby the probable age of these bones: our alluvial border, at least, bears no marks of volcanic agency. It emerged from a sinking sea; its organic remains are of an indefinite age. Did the Santos mound come above water by the same process?